

# Quality Assessment and Patient Participation in Care by Means of a Touch-Screen Computer

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## ABSTRACT

At the University of Utah Health Sciences Center's Sports Medicine Physical Therapy Center, the staff have developed a questionnaire asking for information on history, health status, and satisfaction, incorporating some questions from the SF-36. Each patient answers the questionnaire twice, at admission and at discharge. A touch-screen computer system is used to present the questionnaire to the patients, with the patient touching the selected response on the monitor screen. The data collected are stored directly into a computer database, and a hard copy of the questionnaire and answers is printed for immediate use by the physical therapist. A 3-month pilot evaluation period assessed patient and provider acceptance and use of the touch-screen system. This paper describes the results. (*Clinical Performance and Quality Health Care*. 1996;4:10-13.)

## INTRODUCTION

Health care reform has focused attention on increasing the cost-effectiveness of medical care, with particular emphasis on evaluating the results of care to identify the most effective and efficient management strategies, and to use outcomes as an indicator of the quality of care. To be meaningful to both care provider and patient, outcomes assessment must reflect both provider and patient viewpoints.

Providers usually are interested in "objective" outcomes, measured by pathophysiologic indicators such as blood pressure, blood sugar level, or tumor size. The patient is more interested in how the disease and its treatment affect daily functioning and living. For example, is there pain? Has the pain been increasing? Is there limitation in physical activities, and if so, how much? Is the patient depressed? These "subjective" health status outcomes, obtainable only through direct questioning of the patient, need to be considered together with the objective pathophysiologic outcomes to determine appropriate care and care quality.<sup>1</sup>

Health status assessment is defined as "the measurement or evaluation of the health of an individual or a patient; it may include

traditional biologic indicators, but it emphasizes indicators of physical functioning, mental health, social functioning, and other health-related concepts such as pain, fatigue, and perceived well-being."<sup>2</sup>

As early as the 1950s, health status assessment instruments have been developed, largely to classify patients by physical function. These earlier measures were brief and simple scales, often not well validated. The measures that followed expanded to include mental well-being. In the 1970s, a large number of assessments were developed that were well validated, reliable, and precise. Many were for specific diseases or problems, such as pain or cancer; others were generic (non-disease-specific). Because of their length and comprehensiveness, these instruments were used mostly for research and to gather population data. An example is the Sickness Impact Profile (SIP),<sup>3</sup> which contained more than 100 questions and could take as much as an hour to complete. In recent years, comprehensive, multidimensional (physical, mental, social) measures have been developed that are shorter in length, with the aim of being used in clinical settings. Some have been built from longer, well-validated and reputable "parent" forms. For instance, the SF-36 (Short Form-36 Questions) is developed in the Medical

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Outcomes Study,<sup>4</sup> which started in 1988. Many, like the SF-36, have been validated and compared well to the longer parent ones. There has been an exponential increase in the use of these health status assessments to measure outcomes. For instance, as of July 1993, the SF-36 has been used in 260 clinical trials.

One obstacle faced by studies in outcomes research, and health status assessment, is the effort required for data collection and subsequent data entry into a computerized database. Without the latter, analysis is difficult, and the usefulness of the data is limited. This is an especially acute problem if it is important that data be collected from the patient repeatedly, for instance, during every visit, to correlate and time the patient's progress with treatment.

A touch-screen computer system has been proposed as a solution to this problem with data collection and entry. Patients are asked to answer questions by touching the selected responses (such as "yes" or "no") on a touch-screen computer monitor. The presentation is thus virtually identical to having the patient check off responses on paper, but with the added advantage of storing the data directly into a computer database. This paper describes a pilot evaluation of the feasibility of using a touch-screen computer to collect health status and satisfaction data directly from the patients at the University of Utah Health Sciences Center's Sports Medicine Physical Therapy Center.

## METHOD

At the University of Utah Health Sciences Center's Sports Medicine Physical Therapy Center, the staff developed a health status questionnaire, incorporating some questions from the SF-36. The therapists planned to use the questionnaire as part of routine patient care. Each patient is asked to answer the questionnaire twice, at admission and at discharge. The information gathered by the admis-

sion questionnaire is used by the therapist to fine-tune the patient management plan, and to establish the patient's baseline status. The information gathered by the discharge questionnaire is compared with that from the admission visit, and the patient's progress as a result of therapy thus is documented. Discharge may be postponed if no significant progress has been made. Ultimately, the data will be combined with demographic and other clinical data from the Sports Medicine database for analysis and comparison of the effectiveness of different therapies.

The questionnaire consists of three parts. Part one asks for the patient's past history and details of the patient's symptoms and impairment. It is presented to the patient only once, at the admission visit. Part two asks health status questions. It is presented to the patient twice, at the admission visit and at the discharge visit. Part three of the questionnaire contains visit satisfaction questions, and a 1 to 10 scale evaluation of the ease of using the touch-screen system. This part of the questionnaire is presented only at the discharge visit.

During the admission visit, the questionnaire is answered while the new patient is waiting to see the physical therapist. A staff member of the physical therapy center (most frequently a physical therapy aide) is available to assist the patient continually for this initial contact with the touch-screen. The few questions that require a "written" (more accurately, "typed") answer, as opposed to selecting from a list of responses, will be typed by the staff member, unless the patient prefers otherwise. On completion, a paper copy of the questions and answers is printed, given to the physical therapist for immediate use during the visit, and put in the medical record. The information supplied by the patient is used by the therapist in planning therapy for the patient. Using the printout, the therapist discusses the proposed plan of treatment with the patient. For instance, if the patient's expectation of recovery is viewed as

unrealistic by the therapist, an understanding can be achieved through discussion and planning at this stage.

The decision to discharge the patient is made by the therapist or on patient request. If the visit is to be the last, the patient is asked to answer the questionnaire (the "discharge" version); again, on completion, a paper copy of the questions and answers is printed and given to the therapist. It is anticipated that after the first contact with the touch-screen during the admission visit, the patient may need only intermittent assistance from staff members in using the touch-screen. None of the questions in the follow-up questionnaire requires typing of answers. Based on the patient's progress as reflected by the information contained in the initial and discharge printouts, the therapist may decide not to discharge the patient, or to advise the patient against discontinuing therapy. If therapy continues, when the patient is again considered for discharge, the discharge questionnaire will be answered. Because the discharge questionnaire has satisfaction questions, this provides a chance to address the concerns of the patient, if any.

The computer program that presents the health status and satisfaction questionnaire on the touch-screen computer system is written in Microsoft Visual Basic (Redmond, WA). Data are stored in an Oracle SQL (Redwood City, CA) database, as part of the Ambulatory Care Information System of the University of Utah Health Sciences Center.

The first 3 months of implementation of the touch-screen system were used to evaluate patient and provider acceptance. Because the physical therapists plan to incorporate the health status and satisfaction questionnaires into their routine patient care, falling back on the paper form if the touch-screen should prove not feasible, an observational study was planned to evaluate the method of obtaining data directly from the patient using a touch-screen monitor.



TABLE 1

## PATIENT SATISFACTION RESULTS: QUESTIONS 1 TO 7\*

Question	Average Score	Omissions
1. I feel that there is enough room in the clinic during my treatments ( <i>n</i> = 41)	1.2	5
2. The equipment is available without unnecessary waiting ( <i>n</i> = 39)	1.3	7
3. Office personnel are friendly and helpful ( <i>n</i> = 41)	1.0	5
4. The therapist does not keep me waiting for my scheduled appointment ( <i>n</i> = 42)	1.2	4
5. I feel as if I receive individual attention and that the therapist takes enough time with me ( <i>n</i> = 41)	1.2	5
6. My therapist and my physician work as a team on my case, and each is well informed of the other's action ( <i>n</i> = 42)	1.7	4
7. As a result of my physical therapy treatments, I generally feel better and stronger ( <i>n</i> = 41)	1.4	5

\*Questions 1 to 7 are scored on a 5-point scale: 1 = definitely true; 2 = mostly true; 3 = not sure; 4 = mostly false; 5 = definitely false.

TABLE 2

## PATIENT SATISFACTION RESULTS: QUESTIONS 8 AND 9\*

Question	Average Score	Omissions
8. Please rate the overall value (to you) of your physical therapy visits ( <i>n</i> = 42)	9.0	4
9. Please rate the overall value (to you) of answering these questions ( <i>n</i> = 43)	6.9	3

\*Questions 8 and 9 are scored on a 1 to 10 scale: 1 = not valuable; 10 = very valuable.

Starting October 1, 1994, all new patients at the University of Utah Health Sciences Center's Sports Medicine Physical Therapy Center were invited to use the touch-screen system. No new patients were excluded. Assistance (for instance, interpretation or reading) was available from staff members. Patients unable or unwilling to use the computer were interviewed by staff members using the touch-screen to enter the responses. The patient's medical record number was used as the identification (ID). On entering the ID, some patient demographics are presented for verification of identity.

## RESULTS

So the Center's aide could become familiar with the questions, a 3-day practice session was held before the start of the study, and nine patients answered the paper questionnaire during that period.

After this period, from October 1, 1994, to December 31, 1994, a total of 242 new patients were asked to use the touch-screen system. Among the 251 patients seen during the study period, the youngest was 10 and the oldest 90 years old. Average age was 37 years, and 51% of the patients were male.

For the admission visit, 211 patients (87%) among the 242 patients offered the computer used the touch-screen. Among these, 187 patients had an aide (a member of the Sports Physical Therapy Center staff) help with the typing, but the remaining 24 declined the aide's assistance totally. Among the patients who were willing to use the computer, the average age was 36 years (the youngest was 10 and the oldest 90 years), and 55% were male.

Among the 31 patients who did not use the touch-screen, 18 were unable to use the computer because of physical handicaps, and

one patient just refused to use the computer. In addition, eight patients answered the questionnaires on paper because the computer program was "down," mostly because of a break in network connection between the sports therapy center, which is located off-site, and the University of Utah Hospital, which houses the ambulatory care information system server. Four patients had a medical record number that did not match that stored in the ambulatory care information system. These 31 patients answered the paper questionnaire. The average time taken for the 14-page admission questionnaire was 8.2 minutes for those patients using the touch-screen computer without help, and 10.2 minutes with help.

During the 3-month pilot evaluation period, 46 patients have been discharged and have answered the discharge questionnaire. Unfortunately, 16 patients answered the paper questionnaire by mail, because the therapists forgot to ask the patients to use the computer at the time of discharge. Of the remaining 30 patients, 21 (70%) used the touch-screen computer without assistance from the therapy center's staff, and 8 patients used the touch-screen computer with help. Thus, a total of 29 patients (97% of those offered) used the touch-screen on discharge. One patient was unable to use the computer because of a physical handicap.

The discharge questionnaire had one question specifically asking the patient to rate the ease of use of the touch-screen system on a 1 to 10 scale (1 is very difficult, 10 is very easy). The average score was 9.0 among the 29 patients who used the system. The average time taken for the 9-page discharge questionnaire was 7.2 minutes for those patients using the touch-screen computer without help from the center's staff, and 5.9 minutes with help.

There has been concern on the part of the therapists that the patient may not answer the satisfaction questions honestly if they think that the therapists may be offended by negative feedback, even though

the satisfaction questions are asked only at discharge. It is thought that if a patient omitted answering certain questions, it may indicate that the patient felt uncomfortable about answering the question. Tables 1 and 2 list the satisfaction questions, the average score, and the number of omissions ( $n = 46$ ).

## FUTURE DIRECTIONS

These preliminary results are thought to be very encouraging. The Physical Therapy Center's staff

view health status and patient satisfaction information to be vital to quality patient care, and are continuing to use the information gathered with the help of the touch-screen system as part of routine patient management. Other clinics of the University of Utah Health Sciences Center, including medicine, general surgery, obstetrics and gynecology, orthopedic surgery, pain management, dental, and neurology and neurosurgery, are preparing to implement similar systems adapted to their needs.

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